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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,719

05/02/2006

Tetsuya Nakayama

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12/17/2007

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EXAMINER

VILAKAZI, SIZO BINDA

ART UNIT

PAPER NUMBER

4147

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,719	<b>Applicant(s)</b> NAKAYAMA ET AL.	
	<b>Examiner</b> Sizo B. Vilakazi	<b>Art Unit</b> 4147	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/02/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadahiro et al. (US Patent #6,467,337 B2), and Katayama (US Patent #4,696,277).

3. In Re claim 1, Sadahiro et al. discloses:

- a. a tank contents amount measurement means which measures an amount of substance contained in a fuel tank of a machine (Column 5, Lines 2-3)
- b. an operational value measurement means which measures a predetermined operational value related to fuel consumption operation of a machine (Column 5, Line 10)
- c. a remaining fuel amount calculation means which calculates an expected remaining fuel amount, which is an amount of remaining fuel which ought to be present within said fuel tank, based on a measurement value from said operational value measurement means (Column 5, Lines 53-57)
- d. an amount comparison means, which compares said amount of contents which has been measured by the tank contents amount measurement means,

with said expected remaining fuel amount which has been calculated by said remaining fuel amount calculation means (Column 6, Lines 15-20)

4. Sadahiro does not disclose an alarm issue means which issues an alarm in response to said amount comparison means

5. However, Katayama teaches an alarm issue means which issues an alarm in response to an amount comparison means in his disclosure of an alarm system that sounds upon detection of an air-to-fuel ratio that is significantly different from the desired value (Column 12, Lines 47-63)

6. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the fuel management system of Sadahiro et al. with an alarm issue means as taught by Katayama in order to obtain the present invention

7. In Re claim 2, where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). *Ex Parte Smith*, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing *KSR v. Teleflex*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, since the applicant has submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a), because the calculation of a refueling amount, when the remaining fuel amount is already known, is no more than the mere application of a known technique (subtraction of the remaining

fuel amount from the maximum fuel amount) to a piece of prior art ready for improvement.

8. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadahiro et al. (US Patent #6,467,337 B2) and Katayama (US Patent #4,696,277) as applied to claim 1 above, and further in view of Reimer (US Patent #6,484,088 B1).

9. In Re claim 3, Sadahiro modified by Katayama has been discussed above, but does not disclose an operational value measurement means that measures the operating hours of said working machine.

10. However, Reimer discloses a method where an operational value measurement means measures the operating hours of said working machine, and said remaining fuel amount calculation means calculates a fuel consumption amount of said working machine from said operating hours which have been measured by said operational value measurement means, and calculates said expected remaining fuel amount from said fuel consumption amount which has thus been calculated (Column 2, Lines 51-60).

11. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the fuel management system disclosed by Sadahiro with a means of measuring operating hours as disclosed by Reimer.

12. Using the engine operational value of fuel consumed per time or distance measure, in conjunction with the operating hours of the engine or distance traveled in order to get a remaining fuel amount, hours until all fuel is consumed, or remaining distance amount, is a well known application in various trip computers and fuel management systems.

13. In Re claim 4, Reimer discloses an alternative method taught by the invention where said operational value measurement means calculates or measures a fuel injection amount of an engine of said working machine and said remaining fuel amount calculation means calculates a fuel consumption amount of said working machine from said fuel injection amount which has been calculated or measured by said operational value measurement means, and calculates said expected remaining fuel amount from said fuel consumption amount which has thus been calculated (Column 2, Lines 51-60).

14. In Re claim 5, Reimer discloses a fuel management system wherein the tank contents amount measurement means measures a volume of said contents in said fuel tank (Column 5, Lines 46-47), and said remaining fuel amount calculation means calculates an expected volume of said remaining fuel which ought to be present in said fuel tank (Column 2, Lines 43-60).

15. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadahiro et al. (US Patent #6,467,337 B2) and Katayama (US Patent #4,696,277) as applied to claim 1 above, and further in view of Tatsuya (JP Pub 2003-254173).

16. In Re claim 6, Sadahiro et al. and Katayama have disclosed the claimed invention above except said tank contents weight measurement means.

17. However, Tatsuya discloses a tank contents weight measurement means which measures weight of the contents in said fuel tank (Paragraph 12, Lines 1-2).

18. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the fuel management system disclosed by Sadahiro to measure the tank content amounts using weight as opposed to volume,

as they both perform the equivalent function of measuring an amount of substance in the fuel tank.

19. Note that where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). *Ex Parte Smith*, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing *KSR v. Teleflex*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly, since the applicant has submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a), because the calculation of a remaining fuel weight, when the remaining fuel volume amount is already known, is no more than the mere application of a known technique (multiplication of volume by a specific gravity value) to a piece of prior art ready for improvement.

20. Furthermore, in light of the volume comparison means disclosed in *Sadahiro*, setting up a weight comparison means would have been obvious to one having ordinary skill in the art at the time the invention was made.

21. In Re claim 7, *Tatsuya* has disclosed the claimed invention above except said remaining fuel amount calculations means that calculate the expected weight of said remaining fuel which ought to be present in said fuel tank.

22. However, Sadahiro discloses a remaining fuel amount calculations means that calculates the expected volume of said remaining fuel which ought to be present in fuel tank.

23. The calculation of a remaining fuel weight, when the remaining fuel volume is already known, is no more than the mere application of a known technique (multiplication of volume by a specific gravity value) to a piece of prior art ready for improvement.

24. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system disclosed by Sadahiro to obtain the expected weight of the remaining fuel.

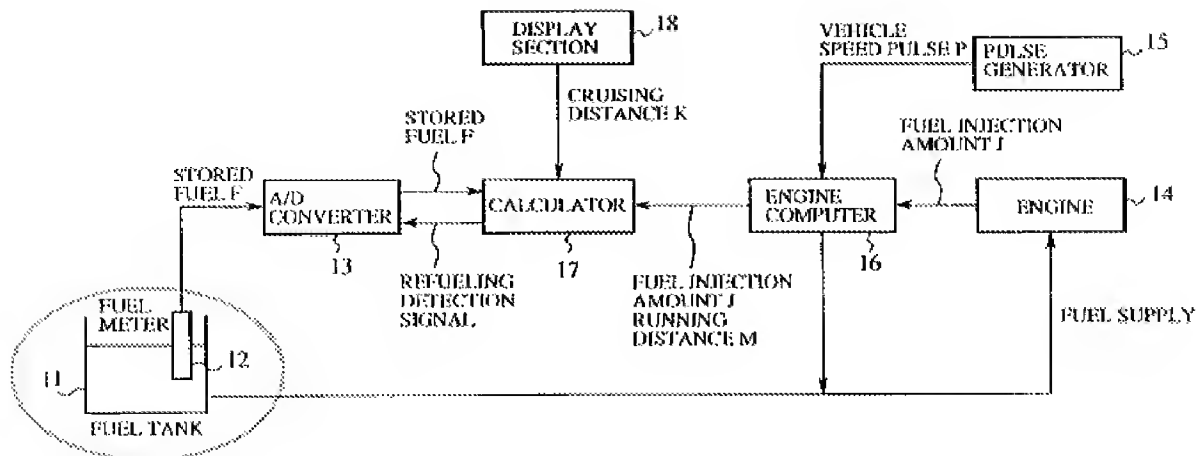
25. In Re claim 8, Sadahiro discloses the claimed invention above except said alarm issue means that issue an alarm in response to said volume comparison means.

26. However, Katayama teaches an alarm issue means which issues an alarm in response to an amount comparison means in his disclosure of an alarm system that sounds upon detection of an air-to-fuel ratio that is significantly different from the desired value (Column 12, Lines 47-63)

27. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the fuel management system of Sadahiro et al. with an alarm issue means as taught by Katayama in order to obtain the claimed invention.



FIG. 2



28. In Re claim 9, with reference to Fig. 2, Sadahiro inherently teaches a fuel management system wherein, immediately after said working machine starts and immediately after said working machine stops, said tank contents amount measurement means measures the amount of said contents while said operational value measurement means measures said operational value.

29. In Re claim 10, under MPEP Section 2112.02, "if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device".

30. Thus the process claimed, being the method performed by the device in claim 1, would have been obvious to one having ordinary skill in the art at the time the invention was made.

***Conclusion***

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wickert et al. disclose a method for metering an emission control reagent. To et al. disclose a method of calculating distance to empty for a fuel tank. Bauerle discloses a method of calculating fuel economy range. Masuda et al. disclose a trip computer that calculates, among other things, distance traveled, remaining fuel value, and capable travel distance based on fuel level.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIZO B. VILAKAZI whose telephone number is (571)270-3926. The examiner can normally be reached on M- F: 9:00am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on (571) 272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4147

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sizo B Vilakazi  
Examiner  
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